

BERCU, L., Conf.; SEGALL, U., dr.; VELICU, V., dr.

Studies of two cases of periarteritis nodosa with prolonged remission. Med. int., Bucur. 8 no.4:584-590 Aug 56.

1. (Lucrare efectuata in Spitalul de stat nr. 12, Bucuresti).
(PERIARTERITIS NODOSA, case reports
two cases with prolonged remission)

BLAGOVESHCHENSKAYA, Nataliya Sergeyevna; SEGALOV, Viktor Yefimovich;
POPOV, A.S., red.; ANDREYEVA, L.S., tekhn. red.

[Organization of socialist competition in an enterprise] Organizatsiia sotsialisticheskogo sorevnovaniia na predpriatii.
Moskva, Profizdat, 1963. 94 p. (Bibliotekhka profsoiuznogo aktivista, no.15 (63)) (MIRA 16:12)
(Socialist competition)

VASIL'YEV, K. V.; ISACHENKO, A. A.; SEGALOVA, O. I. engineer

"Study of the Plasma Arc Out"

paper presented at 18th Annual Assembly, Intl Inst of Welding, Paris, 5-10 Jul 1965.

ANTONOV, I.A., kand.tekhn.nauk; VASIL'YEV, K.V.; kand.tekhn.nauk; SEGALOVA,
O.I., inzh.

Standardization of equipment for gas-electric severance cutting.
Svar.proizv. no.540-41 My '65. (MIRA 18'6)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut avtogennogo
mashinostroyeniya.

1ST AND 2ND CROSS										3RD AND 4TH CROSS									
PROCESSES AND PROPERTIES INDEX																			
<p><i>Ch</i></p> <p>Study of structure-mechanical properties and thixotropy in oleocolloidal systems. E. E. Sazulova and P. A. Reblinder. <i>Kolloid. Zhur.</i> 10, 223-40(1948).—The yield-point P of a grease is measured by immersing into the grease a steel cone (whose angle is 2α) under a const. load F until the cone stops; if its max. immersion is h, $P = (1/\alpha) \cos^2 \alpha \cdot \cot \alpha \cdot F/h^2$. This equation is confirmed for 20% soln. of com. Ca stearate CaSt in a mineral oil when F is varied from 1 to 6 g., α from 22.5 to 45° and h from 2 to 8 mm. The equation is invalid for more-brittle systems. Gels of CaSt in oils have high P (e.g. 80 g./sq. cm.) after the first solidification (on cooling); if the gels are stirred until quite liquid and then allowed to set, P rises to, e.g. 4 g./sq. cm. only, and this P can be reached after repeated stirrings and settings. The duration of setting increases after every thixotropic cycle. The P of gels made of 20% pure CaSt + $x\%$ oleic acid in purified liquid petrolatum has a max. at $x = 4$ or $x = 1$ for gels produced by cooling or by thixotropic set, resp. The rate of vertical movement of a grooved Al plate suspended in the gel and lifted by a measurable force allows sepn. of the elastic aftereffect and the relaxation creep of the system. The former is considerable in gels produced by cooling, and the latter is preponderant in the other type. The solns. of CaSt in oils can be represented by a system of springs and dashpots. J. J. Silbermann</p> <p><i>Chair Colloid Chem, Moscow State U.</i></p>																			
<p>ASH-SLA METALLURGICAL LITERATURE CLASSIFICATION</p> <p>25000 25100 25200 25300 25400 25500 25600 25700 25800 25900 26000 26100 26200 26300 26400 26500 26600 26700 26800 26900 27000 27100 27200 27300 27400 27500 27600 27700 27800 27900 28000 28100 28200 28300 28400 28500 28600 28700 28800 28900 29000 29100 29200 29300 29400 29500 29600 29700 29800 29900 30000 30100 30200 30300 30400 30500 30600 30700 30800 30900 31000 31100 31200 31300 31400 31500 31600 31700 31800 31900 32000 32100 32200 32300 32400 32500 32600 32700 32800 32900 33000 33100 33200 33300 33400 33500 33600 33700 33800 33900 34000 34100 34200 34300 34400 34500 34600 34700 34800 34900 35000 35100 35200 35300 35400 35500 35600 35700 35800 35900 36000 36100 36200 36300 36400 36500 36600 36700 36800 36900 37000 37100 37200 37300 37400 37500 37600 37700 37800 37900 38000 38100 38200 38300 38400 38500 38600 38700 38800 38900 39000 39100 39200 39300 39400 39500 39600 39700 39800 39900 40000 40100 40200 40300 40400 40500 40600 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VASIL'YEV, K.V., kand. tekhn. nauk; MOROZOV, M.Ye., kand. tekhn. nauk;
SEGALOVA, O.I., inzh.

Heat exchange in water-cooled nozzles. Trudy VNIIAvtogen
no.11:110-116 '64. (MIRA 18:3)

Sapozlova, Ye. Ye.

Cond Chem Sci

Dissertation: "Investigation of Thixotropy and the Elastic -Plastic Properties
in Dispersions of Calcium Stearate."

Moscow Order of Lenin State U Ineni M. V. Lomonosov.

20 April 49

SO Vecheryaya Moskva
Sum 71

SPETSIYALNAYA, YE. YE.

"Investigation of Thixotropy and the Elastic-Plastic Properties in Oleogels of Calcium Stearate." Thesis for degree of Cand. Chemical Sci. Sub. 21 Jun 48, Sci. Inst. - "Fertilizers and Insectofungicides" imeni Ya. V. Gerasimov, Ministry of the Chemical Industry USSR

Summary 12, 18 Dec 52, Dissertations Presented for Degrees in Science and Engineering in Moscow in 1948. From Vochernnyaya Moskva. Jan-Dec. 1949.

Elasto-plasto-viscous properties of structured disperse systems. P. A. Rebrinder and E. R. Serezhova (Lomonosov State Univ., Moscow). *Doklady Akad. Nauk S.S.S.R.* 71, 85-8 (1950).—Kinetic curves of the increase of the shear σ with the time τ , under a const. stress P , are of 2 types. At P below P_0 (upper elastic limit or yield point), σ reaches a max. σ_m and remains const.; the strain is completely reversible. At $P' > P_0$, the residual deformation σ_r increases continuously, with $d\sigma/d\tau$ tending to a const. min. $(d\sigma/dr)_\infty$. After removal of the stress, $\sigma = \tau_1 (d\sigma/dr)_\infty$, where τ_1 = length of time of application of the stress. With the instantaneous or initial σ_m conventionally defined as the σ developed at the initial stage $\tau_0 \sim 1$ sec., both σ_m and the elastic deformation $\sigma_m - \sigma_r$ remain const. in the flow for any length of time. The transition from one type to another is detd. by the value of P_0 . Further characteristic magnitudes, invariant towards the particular type of app. used and, in the range of shearing stresses not high enough to produce structural disruption or orientation in the flow, also towards P , are: the initial shearing stress $E_0 = P_0/\epsilon_0$; the true (relaxational) viscosity $\eta_1 = P'/(d\sigma/dr)_\infty$, where $P' = P - P_0$, or, within any time τ_1 after unloading, $\eta_1 = P'/(d\sigma/dr)_\infty$; the modulus of elasticity $E_1 = P/(\sigma_m - \sigma_r)$; the conventional viscosity of elastic aftereffect, $\eta_2 = P/[d\sigma/dr] - (d\sigma/dr)_\infty$. These magnitudes are derived from $\sigma(\tau)$ curves obtained by the method of tangential displacement of a plate in a plane slit or by

the cylinder-torsion method. For systems such as sols of metal soaps in hydrocarbons with addins. of surface-active substances, coagulation structures formed by microcrystallites of paraffin in petroleum products, rubber solutions, colloidal suspensions of bentonite clays in H₂O, etc.: E_1 was found to vary between 1×10^6 and 3×10^6 dynes/cm.²; η_1 from 8×10^{-3} to 2×10^{-2} dynes·sec./cm.; E_2 from 7×10^5 to 1×10^6 , η_2 from 7×10^4 to 7×10^5 dynes·sec./cm. The relaxation times t_{rel} from 0 to 2×10^4 dynes/cm.². The relaxation times calculated from these characteristics are 30-90 sec. for rapid

lastic, and 6-17 hrs. for true relaxation of the stresses.
N. Thom

2

CA

Elastic-plastic properties of oleogels of calcium stearate.
E. R. Segalova, P. A. Rebinder, and L. N. Sentyurikhina
(Univ. Moscow). *Kolloid. Zhur.* 13, 401-72 (1951); cf.
C. A. 44, 0230e. Solution of $x\%$ Ca stearate (I) +
(30 - x)% stearic acid in paraffin oil at 120° and cooling re-
sulted in gels whose "plastic strength" P_a (deterd. in a conical
plastometer) linearly increased from 200 at $x = 20\%$ to
1700 g wt./sq. cm. at $x = 0\%$. After stirring, P_a of these
gels became very small and then slowly increased. Mixts. of
 $y\%$ I + $ay\%$ oleic acid in paraffin oil formed gels if a was
between 0.1 and 1.5. P_a of "condensation" gels (II) (i.e.
produced by cooling) and of "dispersion" gels (III) (after
thixotropic setting) was max. at $a = 0.4$. When a plate
was slowly withdrawn from a container 2.7 cm. wide (filled
with III) by stress P (dynes/sq. cm.), the rate of with-
drawal ds/dt gradually decreased to zero as long as $P <$
 P_1 ; at P_1 and greater stresses ds/dt gradually decreased to a
const. value which was greater, the greater P . At even
greater P , ds/dt after being const. for a time rapidly in-
creased. At $P > P_2$ the plate did not return to the initial
position after taking the stress off. The remaining deforma-
tion ϵ_m and deformation ϵ_a produced at once after applica-
tion of stress P increased linearly with P . For $y = 30$ and
 $a = 0.1$, ϵ_m was 2×10^{-2} cm. at $P = 12,000$ and 18,000 for
III and II, resp., and ϵ_a was 2×10^{-2} cm. at $P = 6000$ and
18,000, resp. The relaxation viscosity η_1 and after-effect
viscosity η_2 were independent of P . At $a = 0.4$ the yield
stress P_1 (kilodynes/sq. cm.) was 137 and 32 for $y = 30\%$,

300 and 44 for $y = 30\%$, and 600 and 306 for $y = 40\%$, in
II and III, resp. At $y = 30\%$, P_2 was 137 and 32 for $a =$
0.4, 64 and 29 for $a = 0.6$, 39 and 23 for $a = 0.8$, and 21
and 16 for $a = 1.0$, in II and III, resp. In all III systems
 P_2/P_1 was approx. 7. The growth of P_1 , η_1 , and moduli
of elasticity during thixotropic setting of $y = 40\%$, $a = 0.04$,
is shown in graphs and a table. I. I. Bikerman

1. REBINER, P. A., ACAD., SEGALOVA, YE. YE.
2. USSR (600)
4. Colloids
7. New problems of colloid chemistry of mineral binding materials. Priroda 41, no. 12, 1952.
9. Monthly List of Russian Accessions, Library of Congress, March 1953. Unclassified.

SEGALOVA, Ye. Ye. and REBINDER, P. A. Acad.

"Investigation of the Processes of Structure Formation in Concentrated Suspensions of Cement," a paper given at the All-University Scientific Conference "Lomonosov Lectures", Vest. Mosk. Un., No.8, 1953.

Translation U-7895, 1 Mar 56

Segalova, E. E.

/Physicochemical investigations of structure formation in cement suspensions. E. E. SEGALOVA, P. A. REBINDER, AND O. I. LUN'YANOVA. *Vestnik Mosk. Univ.* 9, Ser. Fiz.-Mat. i Estest.-Nauk. No. 1, 17-22 (1954). — Cements of low and high aluminate content were used to determine the kinetics of strength increase. Addition of any amount of sulfite alcohol wash water causes, after mixing, dilution and drop in plastic strength. This is followed by a sharp rise in plastic strength. Addition of wash water at which maximum strength occurs increases with amount of tricalcium aluminat in the cement and its dispersion. Rise in strength is explained by lack of plasticizer to stabilize the newly formed particles which become linked along the unprotected portions of the surface, forming a coagulation-crystalline structure. Addition of gypsum produced similar results: at first dilution, followed by a sharp rise in plastic strength. Addition of both wash water and gypsum seems to cause integration of their stabilizing and dispersing effects. If the addition of one is large compared with the amount of tricalcium aluminat, then no amount of the second will cause the cement to harden too early. If the addition of one or the other is small for the cement of given mineral composition, they cannot prevent the formation of a coagulation-crystalline structure. Such a structure occurs, without any addition, when the cement mixture is ground during mixing. Subsequent grinding destroys this structure. The structure is thixotropic. The maximum volume of precipitate formed in the free settling of suspension corresponds to the formation of coagulation-crystalline structure in the system. This structure is destroyed by stirring the suspension. B.Z.K.

Chair of Colloid Chem.

REBINER, P.A., akademik, professor; SEGALOVA, Ye. Ye., kandidat
khimicheskikh nauk, dotsent. ~~akademik, dotsent.~~

The formation and disintegration of structures. Nauka i zhizn'
22 no.5:21-24 My '55. (MLRA 8:6)

1. Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova.
(Colloids)(Solids)

REBINDER, P.A.; YAMPOL'SKIY, B.Ya.; SEGALOVA, Ya.Ye.

Development of the main trends in scientific activities of the Department
of Colloidal Chemistry at the Moscow State University. Uch.zap.Mosk.un.
174:295-300 '55. (Colloids) (MIRA 9:7)

SEGALOVA, Ye. Ye.; LUK'YANOVA, O. I.

1
"Study of the Structure Formation in Suspensions of Cement Clinkers and of the Influence of Admixtures of Hydrofiltering Plasticizers" (Issledovaniye strukturoobrazovaniya v suspenziyakh tsementnykh klinkerov i vliyaniya dobavok gidrofil'nykh plastifikatorov) from the book Trudy of the Third All-Union Conference on Colloid Chemistry, Iz. AN SSSR, Moscow, 1956

pp 26-36
(Report given at above Conference, held in Minsk 21-24 Dec 53. Research conducted in the Chair of Colloid Chemistry, Moscow State U.; graduate students Z. D. TULOVSKAYA and S. I. KONTOROVICH participated.)

SEGALOVA, E. E.

Investigation of structure formation in aqueous suspensions of gypsum. V. N. IZMAILOVA, E. E. SEGALOVA, AND P. A. REZINBER.
Doklady Akad. Nauk S.S.S.R., 107, (8) 425-27 (1958).—Experiments were conducted with aqueous suspensions of $\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$ containing finely ground quartz or calcite. Kinetics of structure formation were studied from the increase in plastic strength of the structure (shear limit). Structure formation proceeds in two stages: (1) plastic strength is very low and increases gradually; (2) there is a sharp increase in strength after 5 min. which reaches a maximum at 30 min. In the first stage, the structure has a coagulated nature. Crystallization of the dihydrate leads to the growth of small crystals, primarily surface nuclei, and to strengthening of the structural network with the formation of firm crystallization contacts. —D. Z. K.

2/12/58

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SEGALOVA, Ye.Ye.; IZMAYLOVA, V.N.; REBINDER, P.A., akademik.

Development of crystallization structures and variation of
their mechanical strength. Dokl. AN SSSR 110 no.5:808-811 0 '56.

(MIRA 10:1)

1. Kafedra kolloidnoy khimii Moskovskogo gosudarstvennogo universiteta
imeni M.V. Lomonosova.

(Crystallization, Water of) (Gypsum)

Effect of addition of a hydrophilic plasticizer on the properties of concentrated cement suspensions. O. I. Lezhnev, B. B. Segalova, and E. A. Rabinovich (M. V. Lomonosov State Univ., Moscow). *Kolloid. Zh.* 19, 82-8 (1957). Ca hydroxide (II) was irreversibly adsorbed by portland cement (I) powder (of about 1.5 sq. m./g. I) and the amt. x adsorbed by 1 g. II increased linearly with the ratio of I:II and independently of the amt. of H₂O. The color of I in the soln. was decd. colorimetrically after lowering the pH to ~ 8 as the color intensity of I was independent of pH at pH < 8 . The sedimentation vol. of II had a min. at $x = 2.5$ mg.; at small x , I prevented structure formation of II, and at larger x , particles of II were coated with thick gel layers of I. The time of setting of II was raised by I; it was greater the smaller the specific surface of II, the smaller the content of $3\text{CaO} \cdot \text{Al}_2\text{O}_3$ in II, and the greater the ratio of H₂O:II. During the setting period, the concn. of I in the soln. slowly decreased. The strength of the set II was raised by moderate addns. of I (e.g., 0.1-1%). The amt. of chemically-bound H₂O in II increased with the concn. of I, but the rate of binding H₂O was uniformly raised only by small addns. of I (e.g., 0.5%).

L. I. Birkman

SEGALOVA, Ye. Ye.

USSR/Physical Chemistry - Colloid Chemistry, Dispersion Systems.

B-14

Abs Jour: Referat. Zhurnal Khimiya, No 2, 1958, 4045.

Author : O.I. Luk'yanova, Ye. Ye. Segalova, P.A. Rebinder.

Inst :

Title : Heat Liberation in Initial Period of Cement Hydration with Plasticizer Additions.

Orig Pub: Kolloidn. zh., 1957, 19, No 4, 459-464.

Abstract: Methods of quantitative study of initial heat liberation at cement (I) hydration under the conditions of cement mortar slaked inside a calorimeter were developed. The heat liberation kinetics at the initial hydration stage of gypsum-free I with various three-calcium aluminate contents and the influence of hydrophilic plasticizer SSB additions in amounts of 0.1 to 1.0% of the I weight on heat liberation kinetics were studied. The induction stage of I hydration (with reference to heat liberation) increases with the increase of the

Card : 1/2

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SEKALOVA, E.E.

AUTHOR : SEGALOVA E.E., SOLOVYEVA E.S. and REHBINDER P.A.,
~~Member of Academy.~~

TITLE : Development of crystallization structures in tricalcium aluminate suspensions. (Kristallizatsionnoye strukturoobrazovaniye v suspenziyakh trekhkal'tsievogo aluminata. - Russian)

PERIODICAL : Doklady Akademii Nauk SSSR 1957, Vol 113, Nr 1, pp 134-137 (U.S.S.R.)

ABSTRACT : Received: 6/1957
 Reviewed: 7/1957
 The peculiarities of the processes of structure formation in water suspensions of Portland cement are determined generally in the first stages after their production by aluminate minerals, especially by tricalciumaluminate. The study of these processes becomes particularly interesting by the circumstance that just in this stage the system water - cement can be easily influenced in such a way as to regulate the structure of the cement stone. In the case of a mixture of 1 - 5 % tricalciumaluminate and 99 - 95 % quartz sand, only the former substance is responsible for the formation of the structure. The great amount of inert filling substance facilitates the study and approaches the hydration conditions of C_2H to those of the cement dough. The authors characterized

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Development of crystallization structures in tricalcium aluminate suspensions.

the processes of structure formation in the same way as earlier by the kinetics of gradation of plastic strength. Besides, specimens taken from various stages of the development of crystal structure were ground, this leads to an abrupt loss of strength or, in the case of grinding it after 1-2 hours, to a halt in further crystallization. The increase of plastic strength and the process of the chemical binding of water are parallel and terminate at 18 - 20°C after 5-6 hours. In the following 1-2 days the strength increases only by an insignificant degree just as only insignificant amounts of water are bound. A further rise in strength can be effected by dessication of the specimen a renewed moistening reduces the strength to its original value. On the occasion of storing the sample in moistened condition strength decreases gradually after reaching a maximum. In recent years a plastifying admixture - sulphite-spirit wash - was widely used in practical construction. Its influence on the cement dough is more or less determined by the absorption interaction with the aluminate component of the cement clinker. For this reason the authors studied the

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influence of the wash- admixture in suspensions of tricalcium-aluminate. On the one hand, this admixture slows down the structure formation and the hydration as well as the crystallization of the new forms, on the other it causes an adsorption peptization and a dispersion of the initial particles of the C_3A . By this these processes are accelerated. Furthermore, the wash blocks off the points of possible contact and loosens the strength of the crystal structure. The total influence of the wash depends on the predominance on one of these two factors, in the case of one or the other concentration. Hydration slows down and dispersion increases with growing concentration of the wash. No water is bound during an induction period. Not before this period is terminated does an intensive hydration commence. In connection with this process plastic strength increases and leads to the formation of hydroaluminate. In the case of large admixtures of wash strength may increase to 8-10 times its original value. On this occasion the hydroaluminate crystals

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become so small that they cannot be distinguished in the electron microscope with a magnification of 40.000. The highest degree of adsorption of wash amounts to 4,5 g per 1 gram of C₇A. In the case of a further increase of the amount of wash the strength of the crystal structure of the hydro-aluminate again decreases.

(With 2 illustrations, 1 table with 6 micro photographs and 1 table)

ASSOCIATION: Department of Colloidal Chemistry of Moscow State University "M.V. Lomonosow". (Kafedra kolloidnoy khimi i Moskovskogo gosudarstvenoho Universiteta im. M.V. Lomonosova)

PRESENTED BY: -

SUBMITTED: 27.9. 1956.

AVAILABLE: Library of Congress.

CARD 4/4

20-114-3-39/60

AUTHORS: Segalova, Ye. Ye., Izmaylova, V. N., Rebinder, P. A., Member
of the AN USSR

TITLE: Investigation of Supersaturation Kinetics in Connection With
the Development of Crystallization Structures in the Solidi-
fication of Gypsum (Issledovaniye kinetiki peresyshcheniya
v svyazi s razvitiyem kristallizatsionnykh struktur pri tver-
denii gipsa)

PERIODICAL: Doklady Akademii Nauk SSSR, 1957, Vol 114, Nr 3, pp 594-597 (USSR)

ABSTRACT: In the dispersion systems, two types of structures can be
formed: coagulation structures and crystallization structures.
A mechanical destruction of the crystallization structure
during the process of its formation is irreversible even if
hydration still is far from being completed. In this context,
the continuous hydration and the connected crystallization of
the dihydrate do not lead to the formation of a crystallization
structure. This can only be explained by the circumstance
that in this case the favorable conditions for the formation
of the crystallization contacts between the different micro-
crystals of the dihydrate gypsum are lacking. This, in turn,

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Investigation of Supersaturation Kinetics in Connection With the Development of Crystallization Structures in the Solidification of Gypsum

is probably caused by the excessive amount of dihydrate accumulated in the suspension. The value of oversaturation and the kinetics of its change can be observed conductimetrically in the suspension of the semihydrate gypsum. In all suspensions of the semihydrate gypsum, made of over 8 g CaSO_4 /1 liter, the same maximum oversaturation is observed, corresponding to the CaSO_4 concentration of 8,0 g/l in the liquid phase of suspension. This again corresponds to the value which conventionally is assumed as 'solubility' of the semihydrate. The maximum oversaturation remains constant as long as the supply velocity of the ions Ca^{++} and SO_4^{--} into the solution compensates the loss velocity of the same ions as a result of the crystallization of the dihydrate. It can be seen from figure Nr 1, as contained in the paper under review, that the higher the concentration of the suspension the sooner the reduction in the oversaturation begins and the more quickly it is reduced. The decrease in the highest solidity of the crystallization structure of gypsum, as observed in the experiments conducted by the authors of the paper under review, can be explained by the reduction in the maximum level of the oversaturation, which is attained in the presence of the di-

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hydrate additions. The latter reduction (of only short duration) decreases the probability of the growing together of the microcrystals, i.e. the formation of crystallization contacts. If the concentration of the dihydrate in the suspension is high, only small oversaturations take place, lasting only a short while. Under these circumstances virtually no crystallization contacts are formed and thus no solidification structure is created. It is exactly this circumstance which, at a sufficient amount of the new formation accumulated in the suspension - of the dihydrate - prevents further hydration solidification after the not yet fully formed crystallization structure has been destroyed. From this point of view it becomes clear that in suspensions of a highly dispersing dihydrate gypsum, proposed by some authors as a binding material with particular properties, the crystallization solidification is impossible under normal circumstances. The solidity in such systems - if density is sufficiently high - as well as in the case of clays, is caused by the dehydration

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Investigation of Supersaturation Kinetics in Connection With the Development of Crystallization Structures in the Solidification of Gypsum

and the solidification of the coagulation contacts between microcrystals at their closest possible approach. It is known that, unlike the crystallization structures such structures are extremely sensitive to water, i.e. if they are moistened they completely lose their solidity, because the solidity of coagulation contacts is reversible if the thickness of the water layer between the particles is changed. There are 3 figures and 7 references, 6 of which are Slavic.

SUBMITTED: April 4, 1957

Card 4/4

AUTHORS: Segalova, Ye. Ye., Solov'yeva, Ye. S.,
Rebinder, P. A., Member of the Academy.

20-1175-32/54

TITLE: A Determination of the Supersaturation Value of Tricalcium Aluminate Suspensions in Water Medium, and the Kinetics of its Variation (Opredeleniya velichiny peresyscheniya v vodnoy srede suspensiy trekhkal'tsiyavogo alyuminata i kinetiki yeye izmeneniya).

PERIODICAL: Doklady AN SSSR, 1957, Vol. 117, Nr 5, pp. 841-844 (USSR).

ABSTRACT: No systematical investigations exist up to now of the value of supersaturation and of the kinetics of its variation. The purpose of the present paper is such an investigation of suspensions of tricalcium aluminate. The measurement of the kinetics of supersaturation in these suspensions was conducted by means of a conductometric method in a nitrogen atmosphere at an optimum velocity of mixing. A diagram illustrates the modification of the specific electric conductivity at 20°C in tricalcium aluminate suspensions with differing concentrations. In all suspensions with a sufficient concentration a constant level of the electric conductivity is arrived at, corresponding to the maximum supersaturation. This constant level is reached comparatively slowly, that is to say, the faster, the higher the concentration of the suspension. At low concentrations it is easily possible to divide the

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20-117-5-32/54

A Determination of the Supersaturation Value of Tricalcium Aluminate
Suspensions in Water Medium, and the Kinetics of its Variation.

curve of the kinetics of the electric conductivity into two parts. Initially, the electric conductivity increases quickly, until it reaches a sharp salient point, and afterwards it increases much more slowly. Then the mechanism is described, on which these kinetics are based, that is to say, that protective films are formed on the surface of the particles of the tricalcium aluminate consisting of newly formed substances. This may be verified by the following means; 1) By the introduction of small crystals of previously produced, finished hydroaluminate. 2) By the introduction of small admixtures of surface active substances. A diagram illustrates the kinetics of the electric conductivity in suspensions of tricalcium aluminate in the presence of admixtures of finished hydroaluminate of varying quantities and of small admixtures of sulfite-alcohol grains. The admixture of hydroaluminate has a markedly accelerating effect on the increase of the concentration in the solution. The small admixtures of sulfite-alcohol grains (which are completely absorbed by the initially existing particles of tricalcium aluminate) do not modify the maximum level of the electric conductivity, but have an essential influence on the kinetics of the process.

There are 3 figures, and 7 Slavic references.

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A Determination of the Supersaturation Value of Tricalcium 20-117-5-32/54
Aluminate Suspensions in Water Medium, and the Kinetics of its Variation.

ASSOCIATION, State University imeni M. V. Lomonosov, Moscow (Moskovskiy gosudarst-
vennyy universitet imeni M. V. Lomonosova).

SUBMITTED, July 19, 1957.

Card 3/3

20-6-32/47

AUTHORS: SEGALOVA, YE. YE.
Luk'yanova, O. I., Segalova, Ye. Ye., Rebinder, P. A.,
Academician

TITLE: On the Nature of the Induction Period in the Hydration of Portland Cement With Additions of a Hydrophilic Plastifier (O prirode induktsionnogo perioda gidratatsii portlandtsementa s dobavkami gidrofil'nogo plastifikatora).

PERIODICAL: Doklady AN SSSR, 1957, Vol. 117, Nr 6, pp. 1034-1036 (USSR).

ABSTRACT: The interaction between Portland cement with water takes place without a perceptible induction period. The hydrophilic plastifiers (ligno-sulphonates of the "sulphite distiller's wash", in the following called SSS) bring about an induction period. This fact is beside other favorable influences of these additions used for the consolidation of the disperse structure of the cement stone. In spite of several works dealing with the part played by the SSS (references 1-5) the causes of the induction period remain unknown. It is the object of the present paper to determine the part played by the adsorption of the surface-active substance from the water medium of the suspension on the developing small crystals and points of formation of the new phase, the new hydrate formations. The authors found that the initial adsorption of the lignosulpho-

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20-6-32/47

On the Nature of the Induction Period in the Hydration of Portland Cement With Additions of a Hydrophilic Plastifier.

nates in the cement suspension may be considerably reduced and its content in the water medium correspondingly increased. This can be done by the introduction of small quantities of salt which form insoluble compounds at the surface of the cement particles and can therefore be better absorbed by cement than lignosulphonates. Carbonates of alkali metals especially act in this manner. Alone, without SSS, they are not capable of bringing about the induction period. The calorimetric investigation of the cement hydration leads to the determination of the kinetics of the separation of heat (figure 1). The addition of 0,5 % SSS leads to a shorter induction period, after which the hydration takes place more intensively than without such additions. The induction period is rapidly prolonged by increasing K_2CO_3 additions. The separation of heat during this period increases almost proportional with the duration, and the total separation of heat during the induction period increases with increasing content of SSS in the liquid medium. The same rules are also noticed for the separation of heat with increasing total content of SSS in the cement suspension in the case of an equal effective carbonate content (figure 2). By effective quantity is to be understood that which remains after deduction of the

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20-6-32/47

On the Nature of the Induction Period in the Hydration of Portland
Cement With Additions of a Hydrophilic Plastifier.

quantity consumed in the exchange reaction with the Ca-lignosulpho-
nates. The phenomena described raise the assumption that the begin-
ning of the induction period is caused by the presence of a hydro-
philic surface-active substance in the liquid medium of the suspen-
sion. Thus the chief factors determining the duration of the induc-
tion period of the cement hydration in the presence of SSS are:

a) the initial concentration of the plastifier in the water medium
of the cement suspension which is dependent on its total content
and on the quantity of adsorption at the primary cement particles,
b) the velocity of the binding of the plastifier by developing
crystallization points of the hydroaluminate. It has to be pointed
out that the stabilizing action of the layers of adsorption of the
lignosulphonates of the SSS also plays an obvious part in the
plastifying total effect. Thereby the formation of the coagulation-
structures is prevented. These layers may also slow down the disso-
lution of primary cement particles in the water.

There are 2 figures, and 7 references, 6 of which are Slavic.

SUBMITTED: July 19, 1957.
AVAILABLE: Library of Congress.
Card 3/3

SOV-69-20-5-12/23

AUTHORS: Segalova, Ye.Ye., Izmaylova, V.N.

TITLE: Structure Formation in the Hydration-Hardening of Plaster of Paris (Strukturoobrazovaniye v protsessakh gidratsionnogo tverdeniya poluvodnogo gipsa)

PERIODICAL: Kolloidnyy zhurnal, 1958, Vol XX, Nr 5, pp 601-610 (USSR)

ABSTRACT: The laws and mechanism of the formation of a crystallization structure during the hardening of plaster of Paris is investigated. The structure formation takes place in three stages: in the first stage the plastic stability is 1.5 g/cm^2 . After 4-5 min an "avalanche-like" increase in the stability begins which after 30 min reaches a value of 15 kg/cm^2 . If the plaster is kept in a moist surrounding, a slow decrease in stability takes place (Figure 1). If the suspension is stirred during the first stage, the formation of the crystallization structure is not influenced (Figure 2, curve 1). If the stirring takes place after 12-15 min, no structure is formed (Figure 2, curve 4). The maximal stability of the structure coincides with the end of hydration, i.e. with the transition of the plaster into dihydrate. The degree of dispersion of the initial product influences the stability of the crystallization structure, the maximum cor-

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Structure Formation in the Hydration-Hardening of Plaster of Paris

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responding to a dispersion of $12,000 \text{ cm}^2/\text{g}$. At higher degrees of dispersion the stability decreases. The spontaneous drop in the stability of the crystallization structure is the faster, the higher the water content in the suspension (Figure 7). Small additions of dihydrate accelerate the hardening process without decreasing the stability of the crystallization structure. With large additions, stability drops (Figure 8). The change in supersaturation in the suspension in the presence of dihydrate is shown in Figure 9. It is measured by the change in the specific electric conductivity. An analysis of the experimental results shows that the stability of plaster of Paris is due to a crystallization structure caused by crystallization contacts between the crystals. These form in the suspension, if supersaturation is present for a sufficiently long time. There are 11 graphs, 1 table, and 13 references, 8 of which are Soviet, 2 English, 1 German, 1 French, 1 Italian.

ASSOCIATION: Moskovskiy universitet, Khimicheskiy, fakultet Kafedra kolloidnoy khimii (Moscow University, Dept. of Chemistry, Chair of Colloidal Chemistry)

SUBMITTED: April 18, 1958

Card 2/2

1. Gypsum--Hardening 2. Gypsum--Crystal structure

SOV-69-20-5-13/23

AUTHORS: Segalova, Ye. Ye., Sarkisyan, R R., Rebinder P.A.

TITLE: The Effect of Hydrophilic Plasticizer Additions on the Kinetics of Structure Formation in Cement Hardening (Vliyaniye dobavok gidrofil'nogo plastifikatora na kinetiku strukturo-obrazovaniya pri tverdenii tsementa)

PERIODICAL: Kolloidnyy zhurnal, 1958, Vol XX, Nr 5, pp 611-619 (USSR)

ABSTRACT: The influence of hydrophilic organic surface-active substances of the sulfite-alcohol slops type on the properties of cement, concrete, etc. is investigated. A Portland cement suspension passes three phases during mixing: 1) The appearance of a coagulation structure of the cement particles. 2) The appearance of a complex loose crystallization structure of hydro-aluminate. 3) The appearance of a coagulation structure of the initial cement particles and the newly formed micro-crystals. Figure 1 shows the increase in the plastic stability at various intervals of mixing in the presence of sulfite-alcohol slops SSB. The stability decreases due to a prolongation of the induction period of structure formation, then it increases rapidly due to the formation of a hydro-aluminate crystallization structure. Figure 2 shows that the plastic stability increases with the quantity of SSB added. The greatest plasticizing effect is

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The Effect of Hydrophilic Plasticizer Additions on the Kinetics of Structure Formation in Cement Hardening

obtained in phase 1 during mixing (Figure 3). Figure 4 shows the water-cement ratios necessary for the production of an equally plastic cement in the presence of SSB. The greatest plasticizing effect, i.e. the greatest decrease of the water-cement ratio is observed in phase 1 of the mixing. This minimal water-cement ratio does not depend on the mineralogical composition of the cement. The duration of phase 1 with various additions of SSB is given in Table 2 for the two cement types ARM and KMS. Various specimens of cement with different additions of SSB were tested for resistance after 3, 28, and 90 days. The results are given in Figures 5 and 6. The resistance curves for cement with preliminary hydration (Figure 6) show a drop which begins at an earlier stage than in the curves of phase 1 (Figure 5). The final resistance of cement prepared by SSB is always lower than without SSB, if the water-cement ratio is constant (Figure 7). If the initial plasticity is the same (Figure 8), the resistance of the cement is increased in the presence of

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SOV-69-20-5-13/23

The Effect of Hydrophilic Plasticizer Additions on the Kinetics of Structure Formation in Cement Hardening

SSB. There are 3 tables, 10 graphs, and 4 Soviet references.

ASSOCIATION: Moskovskiy universitet, Khimicheskiv fakul'tet, Kafedra kolloidnoy khimii (Moscow University, Dept. of Chemistry, Chair of Colloidal Chemistry)

SUBMITTED: April 18, 1958

1. Cement--Hardening
2. Cement--Chemical reactions
3. Alcohols--Chemical reactions
4. Sulfides--Chemical reactions

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SOV-69-20-5-14/23

AUTHORS: Solov'yeva, Ye. S., Sagalova, Ye. Ye.

TITLE: The Kinetics of the Crystallization Structure Formation in the Hydration Hardening of Tricalcium Aluminate (Kinetika kristallizatsionnogo strukturoobrazovaniya pri gidratatsionnom tverdenii trekhkal'tsiye-vogo alyuminata)

PERIODICAL: Kolloidnyy zhurnal, 1958, Vol XX, Nr 5, pp 620-627 (USSR)

ABSTRACT: The investigation of structure formation in tricalcium aluminate $3\text{CaO} \cdot \text{Al}_2\text{O}_3$ (C_3A) is very important, since this mineral forms part of all Portland cements. The mechanism of hardening of C_3A is here studied. Figure 1 shows that the induction period of structure formation, in which the coagulation structure of the initial particles and of the newly formed crystals appear, is relatively short. The maximal stability of the structure is reached with the transition of the anhydrous aluminate into hydrate (Figure 2). The dependence of the structure stability on the quantity of C_3A formed in the suspension is shown in Figure 3. At the beginning, the formation of C_3A is very intensive, but the stability is low. In the first 30 min, 70% of all C_3A

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The Kinetics of the Crystallization Structure Formation in the Hydration
Hardening of Tricalcium Aluminate

is formed, but stability is only 30% of the total value. If the suspension is stirred 30 min after preparation, a crystallization structure can not form (Figure 4). The inflexion point in the stability curve (Figure 5) indicates the formation of the crystallization structure. After reaching the maximum, the stability of the crystallization structure begins to drop under humid conditions. The structure formation in C_3A suspensions of various water-solid ratios is given in Figure 6. An increase in these ratios, i.e. an increase in porosity, causes a decrease in stability under humid conditions. The phenomena of recrystallization are accelerated by the transition of the hexagonal C_3A , which is unstable, to the stable isometric form. An increase of temperature accelerates recrystallization and causes a sharp drop in stability (Figure 7) due to the solution of crystallization contacts. A further accumulation of the isometric form leads to the development of a new crystallization struc-

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SOV-69-20-5-14/23

The Kinetics of the Crystallization Structure Formation in the Hydration
Hardening of Tricalcium Aluminate

ture which reaches its maximal stability after 15 days.
There are 2 tables, 8 graphs, and 13 references, 10 of which
are Soviet, 3 English.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet Khimicheskiy fakul'-
tet Kafedra kolloidnoy khimii (Moscow State University, Dept.
of Chemistry, Chair of Colloidal Chemistry)

SUBMITTED: March 18, 1958

1. Calcium aluminates--Hardening 2. Calcium aluminates--Chemical
reactions 3. Cements--Preparation

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5(4)

AUTHORS:

~~Segalova, Ye. Yu.~~, Kontorovich, S. I., SOV/20-123-3-36/54
~~Rebinder, P. A.~~, Academician

TITLE:

The Characteristic Features of the Kinetics of Supersaturation
in Aqueous Suspensions of Calcium Oxide (Osobennosti kinetiki
perasyshcheniya v vodnykh suspenziyakh okisi kal'tsiya)

PERIODICAL:

Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 3, pp 509-512
(USSR)

ABSTRACT:

The authors investigate the above-mentioned kinetics in order to find the characteristic features of its hydration hardening and the nature of the supersaturations in these suspensions. The above-mentioned kinetics were determined conductometrically in a special vessel with blackened platinum electrodes, a stirrer, and a thermometer. The experiments were carried out in a nitrogen atmosphere at a temperature of $21.6 \pm 0.05^\circ$. A diagram shows the variation of the electric conductivity (concentration) of an aqueous suspension of CaO as a function of the rate of intermixing of the suspension. According to this diagram, the rate of intermixing has an influence not only on the rate of obtaining the maximum value of the electric conductivity, but also on its

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absolute value. Even at an angular velocity of 1600 revolutions^{p/m} of the mixer, no steady supersaturation was observed. The natural way of detecting the stable level of supersaturation is by introduction of surface-active substances into the aqueous suspensions of CaO. These admixtures practically do not change the solubility and can stabilize the generated nuclei and prevent their growth. In this way, the supersaturation in the liquid phase of the suspension is decreased. The authors introduced admixtures of sulfite-alcohol vinasse (barda) and glucose. By the addition of surface-active admixtures into aqueous suspensions of CaO, their electric conductivity sharply increases. A stable level of supersaturation is obtained by introduction of a sufficient quantity of admixtures. Moreover, it was necessary to investigate the dependence of the obtained maximum supersaturations on the batch of CaO. The greatest increase in temperature (0.5°) was observed only after the introduction of the first batch of CaO. The increase in temperature caused by the introduction of the following batches decreases the number of the introduced batches. The introduction of CaO into the solution of the surface-active substance sharply increases the electric conductivity which then remains constant for some

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Supersaturation in Aqueous Suspensions of Calcium Oxide

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minutes. The fact that the maximum value of electric conductivity is independent of the batch of CaO shows that there is a constant level of supersaturation which can be considered as the relative dissolubility of calcium oxide. The dissolution of CaO proceeds until the maximum supersaturation is attained. A further dissolution proceeds only if the hydrate of calcium oxide crystallizes out from the solution. The concentration of solutions which contain colloid particles can be determined potentiometrically by means of a hydrogen electrode. There are 3 figures, 1 table, and 12 references, 9 of which are Soviet.

ASSOCIATION: Kafedra kolloidnoy khimii Moskovskogo gosudarstvennogo ~~universiteta~~ universiteta im. M. V. Lomonosova (Chair of Colloid Chemistry of Moscow State University imeni M. V. Lomonosov) Otdel dispersnykh sistem Instituta fizicheskoy khimii Akademii nauk SSSR (Branch of Dispersed Systems of the Institute of Physical Chemistry of the Academy of Sciences, USSR)

SUBMITTED: July 18, 1958

Card 3/3

5(4)

AUTHORS:

Andreyeva, Ye. P., Segalova, Ye. Ye.,
Volynets, Ye. Ye.

SOV/20-123-6-26/50

TITLE:

The Influence of Calcium Chloride on the Processes of Structure
Formation in Aqueous Suspensions of Tricalcium Aluminate
(Vliyaniye khloristogo kal'tsiya na protsessy
strukturnoobrazovaniya v vodnykh suspenziyakh trekhkal'tsiyevogo
alyuminata)

PERIODICAL:

Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 6, pp 1052-1055
(USSR)

ABSTRACT:

In order to be able to explain the mechanism of the influence
exercised by calcium chloride on Portland cement it is, above
all, necessary to know its influence upon the processes of
structure formation in suspensions of tricalcium aluminate
(C₃A). This material, which is contained in cement clinker,
determines the character of the processes of structure formation
during the first stages of the interaction between cement and
water. For this purpose the kinetics of structure formation and
of the chemical interaction in suspensions of C₃A and its

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The Influence of Calcium Chloride on the Processes
of Structure Formation in Aqueous Suspensions of Tricalcium Aluminate

SOV/20-123-6-26/50

hydrate $C_3A \cdot aq$ ($3CaO \cdot Al_2O_3 \cdot 6H_2O$) was investigated. These substances were dissolved in solutions of calcium chloride of different concentrations. For such investigations it is best to use mixtures containing from 2 to 10% binding agents and 98-90% filling material (ground quartz sand or calcite). Concentrated suspensions were produced by soaking these mixtures. This made it possible to destroy the crystal structure in the suspension immediately after solution. The samples were kept above water and the corresponding solutions of calcium chloride. The processes of structure formation in the suspensions were characterized by the increase of plastic strength. The results obtained by these experiments are shown by 3 diagrams. The quantity of bound calcium chloride present after the action was the same in all investigated suspensions and amounted to 0.75 mol $CaCl_2$ per 1 mol C_3A . Radiographical and thermographical investigations showed the following: In all suspensions in which the quantity of calcium chloride suffices for binding the entire existing C_3A and its hydrate one and the same compound is formed. The kinetics of the chemical binding of calcium chloride depends to a considerable extent on the composition

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The Influence of Calcium Chloride on the Processes of Structure Formation in Aqueous Suspensions of Tricalcium Aluminate SOV/20-123-6-26/50

of the suspension and especially on the concentration of the calcium chloride solutions. In the solutions of hydroaluminate interaction at first develops more slowly than in suspensions of C_3A after which, however, the rate of setting increases, and this reaction is in all cases completed already on the second day. In suspensions of C_3A (which may be of higher concentration than calcium hydrochloroaluminate) the formation of hydrochloroaluminate at first develops very rapidly, but by the addition of medium quantities of $CaCl_2$ the process becomes more slow. This may be explained by the decelerating influence of hydrochloroaluminate microcrystals which were formed in the case of high degrees of oversaturation and which formed protective films on the surface of the original C_3A -particles. The special features of the kinetics of the interaction between C_3A and its chlorate and calcium chloride determine also the special features of structure formation processes in these suspensions.

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The Influence of Calcium Chloride on the Processes of Structure Formation in Aqueous Suspensions of Tricalcium Aluminate SOV/20-123-6-26/50

In the suspensions C_3A which contain no additions of calcium chloride strengthening continues also after binding of the entire calcium chloride. There are 3 figures and 8 references, 7 of which are Soviet.

ASSOCIATION: Kafedra kolloidnoy khimii Moskovskogo gosudarstvennogo universiteta im. M. V. Lomonosova (Chair of Colloid Chemistry of Moscow State University imeni M. V. Lomonosov)

PRESENTED: August 4, 1958, by P. A. Rebinder, Academician

SUBMITTED: July 10, 1958

Card 4/4

SEBALOVA, Ye. Ye.

15(6)

AUTHOR:

TITLE:

PERIODICAL:

ABSTRACT:

Rebinder, P. A., Academician
New Trends of Colloid Chemistry (Novyye puti razvitiya
kolloidnoy khimii)

307/00-59-1-5/57

Vestnik Akademii nauk SSSR, 1959, Nr 1, pp 44-51 (USSR)

At present, colloid chemistry plays an especially important part in political economy as it is a physical-chemical science concerning the processes of modern engineering. It is of great practical importance to us at present it is possible to carry on uninterrupted technological progress from lyophobic to lyophilic systems. Thus, it is possible to obtain technically important substances with the required mechanical properties. The theory of highly molecular substances and their solutions has developed into an independent branch of colloid chemistry. The vitality of modern colloid chemistry is proved by the fact that it produces many new independent branches of science. Further, the author describes the course of the 4th All-Union Conference of Colloid Chemistry which took place in Tbilisi in May 15-16, 1958. It was organized by the Odaleniy Khimiches-

R. N. Krasnov (Kiyev) reported on the present state of research in the field of colloid states.

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СЕРИЯ 1А, 10. 11.

"The Field of the Kinetics of the Development of Crystallization Structures and of the Increase of their Stability."

report presented at the Section on Colloid Chemistry, VIII Mendeleyev Conference of General and Applied Chemistry, Moscow, 16-23 March 1959.
(Koll. Zhur. v. 21, No. 4, pp. 509-511)

5(4), 24(2)

SOV/20-124-4-41/67

AUTHORS: Segalova, Ye. Ye., Tulovskaya, Z. D., Anelina, Ye. A.,
Rebinder, P. A., Academician

TITLE: Causes of the Loss of Strength of the Monocalcium Aluminate
Crystal Structure Formed
at High Temperature (O prichinakh snizheniya prochnosti
kristallizatsionnoy struktury monokal'tsiyevogo alyuminata,
obrazuyushchey pri povyshennoy temperature)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 124, Nr 4, pp 876-879
(USSR)

ABSTRACT: A short report is first given on the present stage of the
problem and on earlier papers dealing with this subject.
The formation of a crystallization structure of reduced
strength and higher temperature is not due to the formation
of another compound, but to a modification of the conditions
of the crystallizing-out of the hydrate forming these com-
pounds. The authors investigated the kinetics of oversatura-
tions by employing the conductometric method at an optimum
rate of mixing (400 rpm). In order to prevent carbonization
of suspensions, all measurements were carried out in a nitro-
gen atmosphere. In all sufficiently concentrated suspensions

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SOV/20-124-4-41/67

Causes of the Loss of Strength of the Monocalcium Aluminate Crystal
Structure Formed at High Temperatures

a constant level of electric conductivity is established, which corresponds to the maximum oversaturation or to the conditioned solubility of CA (an abbreviation used by the authors for $\text{CaO} \cdot \text{Al}_2\text{O}_3$). In suspensions of CA a constant level of oversaturation is more quickly attained than in tricalcium-aluminate suspensions, but it is still attained much more slowly than in suspensions of semi-aqueous gypsum. The rate at which maximum oversaturation is attained increases considerably with an increase of the concentration of the suspensions. The existence of stable oversaturations which are independent of the concentration of the suspension is also indicated by the results obtained by the quantitative determination of the concentrations of CaO and Al_2O_3 of the liquid phase of the suspension, provided that electric conductivity in this liquid phase has attained its maximum value. The samples used for analysis were chosen from the same suspension in which electric conductivity had been measured. The results obtained by analyses made it possible not only to determine the existence of stable oversaturations in the CA-suspensions, but also to characterize them quanti-

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SOY/20-124-4-41/67

Causes of the Loss of Strength of the Monocalcium Aluminate
Crystal Structure Formed at High Temperatures

tatively. According to the results obtained by the present paper CA is congruently solved: A concentration ratio of CaO and Al_2O_3 in the liquid phase of the suspension is equal to 1, which corresponds to their ratio in the anhydrous compound. At the same time, the solubility of the hydrate $2\text{CaO} \cdot \text{Al}_2\text{O}_3 \cdot \text{H}_2\text{O}$ was determined, which was produced by the hydration of CA at 20° . It amounted to 0.49 g C_2A per 1 l of the solution, which is in good agreement with the data found in publications (Ref 8). The concentration ratio of CaO and Al_2O_3 corresponds to the dicalcium aluminate ($\text{CaO}/\text{Al}_2\text{O}_3 = 2$). The authors carried out similar experiments also at 60° . The curves for the variation of electric conductivity also have a distinct maximum, which increases considerably with an increase in concentration of the suspension, and which becomes noticeable already after a shorter time. In order to be able to determine the amount of stable over-

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Causes of the Loss of Strength of the Monocalcium
Aluminate Crystal Structure Formed at High Temperature

SOV/20-124-4-41/67

saturation, it is necessary considerably to reduce the rate at which CA is dissolved, without hereby varying the experimental temperature. For this purpose a surface-active substance was added to the suspension, viz. sulfite-alcohol-draff. Also at 60° stable oversaturations occur by the hydration of CA. The maximum value of concentrations does not depend on the concentration of the suspensions, but it is attained more quickly at higher concentrations. There are 3 figures, 1 table, and 11 references, 8 of which are Soviet.

ASSOCIATION: Kafedra kolloidnoy khimii Moskovskogo gosudarstvennogo universiteta im. M. V. Lomonosova
(Chair for Colloid-Chemistry of Moscow State University imeni M. V. Lomonosov)

SUBMITTED: October 15, 1958

Card 4/4

5(4)
 AUTHORS: Segalova, Ye. Ye., Kontorovich, S. I., Rebinder, P. A., Academician
 TITLE: Features of Structural Crystallization in the Solidification of Calcium Oxide by Hydration
 PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 129, Nr 6, pp 1343-1346 (USSR)
 ABSTRACT: The authors investigated the process of CaO hydration on suspensions which, besides CaO additionally contained 75% CaCO₃, as inert filling medium, so that the ratio between water and calcium was increased and structural development could be retarded and heating of the samples could be reduced. The pure CaCO₃ had a specific surface of 2000 cm²/g, determined by Tovarov's apparatus. The strength of the suspensions was determined by means of a conical plastometer, and the rate of hydration was determined calorimetrically. Figure 1 and table 1 show the course of the strength and hydration of suspensions with a ratio between water and solid substance (W/S) of 0.4, 0.5, and 0.6. Strength at first increases rapidly as a result of crystallization of the main quantity of Ca(OH)₂, after which it decreases rapidly and only rises gradually with W/S = 0.4 until the end of hydration, as was also observed by G. I. Logginov (Ref 6). ✓

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SOV/20-129-6-40/69

Features of Structural Crystallization in the Solidification of Calcium Oxide
by Hydration

Figure 2 shows that the course of strength does not depend on temperature conditions. As a cause of these variations of strength, the destruction of structure by the occurrence of internal stresses during the growth of the crystals is given. The double character of this process (increase of strength by crystal growth, decrease by destruction of structure) causes the rise and fall of the strength curve, which is particularly marked with $W/S = 0.4$. On the other hand, the dissolution of crystallization contacts becomes effective only in the case of a large W/S . The assumption of several $Ca(OH)_2$ modifications going over into one another was refuted by thermograms and X-ray pictures. O. V. Pyasetskaya collaborated. There are 2 figures, 1 table, and 9 Soviet references.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences, USSR). Kafedra kolloidnoy khimii Moskovskogo gosudarstvennogo universiteta im. M. V. Lomonosova (Chair for Colloidal Chemistry of Moscow State University imeni M. V. Lomonosov)

SUBMITTED: July 31, 1959
Card 2/2

SEGALOVA, Ye.Ye., kand.khim.nauk; REBINDER, P.A., akademik

Modern physical and chemical representation of hardening
processes in mineral binding materials. Stroi.mat. 6
no.1:21-26 Ja '60. (MIRA 13:5)
(Binding materials)

SEGALOVA, Ye.Ye.; KONTOROVICH, S.I.; REBINDER, P.A.

Structuration taking place during the hydration solidification of
calcium oxide of various dispersities. Koll.zhur. 22 no.1:74-81
Ja-F 60. (MIRA 13:6)

1. Institut fizicheskoy khimii AN SSSR Otdel dispersnykh sistem i
Moskovskiy universitet, Kafedra kolloidnoy khimii.
(Lime)

MARKINA, Z.N., SEGALOVA, Ye.Ye., STOKLOSA, Yezhi

Effect of initial binder dispersity on the structuration process
taking place in the course of the hardening of gypsum hemihydrate.
Koll. zhur. 22 no.2:211-216 Mr-Apr '60. (MIRA 13:8)

1. Moskovskiy universitet im. M.V. Lomonosova, Kafedra kolloid-
noy khimii.

(Gypsum)

ANDREYEVA, Ye.P.; SEGALOVA, Ye.Ye.

Crystallizational structuration of calcium aluminate chloride hydrates.
Koll. zhur. 22 no.4:385-392 JI-Ag '60. (MIRA 13:9)

1. Moskovskiy universitet, Khimicheskoy fakul'tet.
(Calcium aluminate chloride)

SEGALOVA, Ye.Ye.; STOKLOSA, Yezhi; MARKINA, Z.N.

Kinetics of supersaturation and tendency to form intergrowth contacts
in the hydration hardening of α and β calcium sulfate hemihydrate.
Koll. zhur. 22 no.4:464-468 J1-Ag '60. (MIRA 13:9)

1. Moskovskiy universitet im. M.V. Lomonosova, kafedra kolloidnoy
khimii.

(Gypsum)

(Crystallization)

ANDREYEVA, Ye.P.; SEGALOVA, Ye.Ye.

Kinetics of structuration in suspensions of tricalcium and β -dicalcium silicates in the presence of calcium chloride. Koll. zhur. 22 no.4: 503-505 J1-Ag '60. (MIRA 13:9)

1. Moskovskiy universitet im. M.V. Lomonosova, Kafedra kolloidnoy khimii.

(Calcium silicate)

(Calcium chloride)

DU YU-ZHU [Tu Yu-ju]; SEGALOVA, Ye.Ye.

Processes of crystal structure formation taking place during the
solidification of calcium aluminate sulfate hydrate. Zhur.prikl.
khim. 34 no.3:521-532 Mr '61. (MIRA 14:5)

1. Kafedra kolloidnoy khimii Moskovskogo gosudarstvennogo
universiteta.

(Calcium aluminate sulfate) (Crystallization)

CHEN PING-I [Chen Ping-i]; L. L. LOMONOVA, O.I.; SHCHUKIN, Ye.Ye.

Metastable solutions of calcium silicates. Dokl. AN SSSR 141
no.1:167-169 N 1967. (MIRA 14:11)

1. Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova.
Predstavleno akademikom I.A. Tolinderom.
(Calcium silicate)
(Solution (Chemistry))

AMELINA, Ye.A.; SEGALOVA, Ye.Ye.; REBINDER, P.A., akademik

Characteristics of solidification processes involved in the formation of crystal structure in semihydrated gypsum suspensions at 20° and 60°. Dokl. AN SSSR 142 no.4:884-886 F '62. (MIRA 15:2)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova i Institut fizicheskoy khimii AN SSSR.

(Gypsum)

(Crystallization)

LUK'YANOVA, O.I.; CHZHOU PIN-I [Chou P'ing-i]; SEGALOVA, Ye.Ye.

Dispersity variation in the process of hydration of calcium
silicates β -Ca₂SiO₄ and Ca₂SiO₅. Dokl.AN SSSR 144 no.1:163-
166 My '62. (MIRA 15:5)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova.
Predstavleno akademikom P.A.Rebinderom.
(Calcium silicates) (Hydration)

TULOVSKAYA, Z.D.; SEGALOVA, Ye.Ye.; REBINDER, P.A., akademik

Temperature dependence of the metastable solubility of
monocalcium aluminate. Dokl. AN SSSR 147 no.1:153-154
N '62. (MIRA 15:11)

1. Moskovskiy gosudarstvennyy universitet im.
M.V. Lomonosova.

(Calcium aluminate)
(Solubility)

AMELINA, Ye.A.; SEGALOVA, Ye.Ye.; REBINDER, P.A., akademik

Induction period of structure formation in the solidification
of hemihydrated gypsum. Dokl. AN SSSR 147 no.2:392-394
N '62. (MIRA 15:11)

1. Moskovskiy gosudarstvennyy universitet im.
M.V. Lomonosova i Institut fizicheskoy khimii AN SSSR.
(Gypsum)
(Crystallization)

ANDREYEVA, Ye.P.; SEGALOVA, Ye.Ye.

Solubility of tricalcium silicate in calcium chloride solutions.
Dokl.AN SSSR 149 no.3:589-591 Mr '63. (MIRA 16:4)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova.
Predstavleno akademikom P.A.Rebinderom.
(Calcium silicates) (Calcium chloride) (Solubility)

SHABANOVA-AMELINA, Ye.A.; SEGALOVA, Ye. Ye.; REBINDEE, P.A.

Effect of the dispersity on the ultimate strength of hardening structures as dependent on the dissolution of the initial binding material. Koll.zhur. 25 no.3:310-374 My-Je '63.

(MIRA 17:10)

1. Khimicheskiy fakul'tet Moskovskogo universiteta i Otdel dispersnykh sistem Instituta fizicheskoy khimii AN SSSR.

KONTOROVICH, S.I.; SEGALOVA, Ye.Ye.; REBINDER, P.A.

Effect of gypsum on the hydration and hydration hardening of calcium oxide. Koll.zhur. 25 no.5;561-566 S-O '63. (MIRA 16:10)

1. Institut fizicheskoy khimii AN SSSR i Kafedra kolloidnoy khimii Moskovskogo gosudarstvennogo universiteta.

BRUTSKUS, T.K.; SEGALOVA, Ye.Ye.

Effect of gypsum additions on the hydration and structure formation
of tricalcium aluminate. Koll.zhur. 26 no.1:11-16 Ja-F '64.
(MIRA 17:4)

1. Moskovskiy universitet, khimicheskiy fakul'tet.

TULOVSKAYA, Z.D.; SEGALOVA, Ye.Ye.; REBINDER, P.A.

Processes of structure formation during crystallization of
monocalcium aluminate at different temperatures. Koll.zhur.
26 no.2:252-257 Mr-Apr '64. (MIRA 17:4)

1. Moskovskiy universitet, khimicheskiy fakul'tet, kafedra
kolloidnoy khimii.

BOBILIN, Ye.Ye.; IL'YASHOVA, I.D.; BUTENKO, T.A.; BRIGOR, E.A.

Phase transitions of hydrates formed by the hydration of calcium aluminates ($\text{CaO} \cdot x\text{H}_2\text{O}$ and $3\text{CaO} \cdot \text{Al}_2\text{O}_3$). Zhur. prikl. Khim. 37 no.6: 1227-1233 Je '64. (MIRA 18:3)

SEGALOVA, Ye.Ye.; TULOVSKAYA, Z.D.; BRUTSKUS, T.K.; REBINDER, P.A., akademik

Formation of stable and metastable hydrates in the hydration of
anhydrous calcium aluminates ($\text{CaO} \cdot \text{Al}_2\text{O}_3$ and $3\text{CaO} \cdot \text{Al}_2\text{O}_3$). Dokl.
AN SSSR 155 no.6:1379-1382 Ap '64. (MIRA 17:4)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova.

CHZHOU PIN-I [Chou P'ing-i]; SEGALOVA, Ye.Ye.; LUK'YANOV, O.I.

Hydration and formation of hardening crystallization structures in concentrated suspensions of β -di- and tricalcium silicates. Koll. zhur. 26 no.3:373-379 My-Je '64.

Formation of supersaturated solutions in the hydration of β -di and tricalcium silicate in dilute aqueous suspensions. Ibid.:341-349

Differentiation of water in cement stone from the nature of its bonding. Ibid.:367-372 (MIRA 17:9)

1. Kiyevskiy tekhnologicheskii institut legkoy promyshlennosti.

ANPHEVA, T.S.; BERLOVA, Tzvo. KERNIKOVA, S.N.

Effect of calcium chloride on the metastable solubility of
calcium bromide silicates. Koll. zhur. 26 no.4:404-408
1984. (MIRA 17:9)

L. Moskovskiy universitet, Khimicheskiy fakul'tet, kafedra
kolloidnoy khimii.

TULOVSKAYA, Z.D.; SEGALOVA, Ye.Ye.

Thermographic study of the hydration of monocalcium aluminate
at various temperatures. Zhur. prikl. khim. 37 no.2:267-
275 F '64. (MIRA 17:9)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

ANDREIENKO, E.I.; REGALOVA, Ye. Ye.

Formation of metastable hydrates in the process of tricalcium
silicate hydration in water and calcium chloride solutions.
Dokl. AN SSSR 158 no.6:1352-1354 G '64. (MIRA 17:12)

I. Moskovskiy gosudarstvennyy universitet. Predstavleno
akademikom P.A. Rebindecom.

KONTOROVICH, S.I.; SEGALOVA, Ye.Ye.; REBINDER, P.A., akademik

Use of the hydration solidification of magnesium oxide to
increase the strength of a magnesium oxide catalyst. Dokl.
AN SSSR, 159 no.1:189-191 N '64. (MIRA 17:12)

1. Institut fizicheskoy khimii AN SSSR i Moskovskiy
gosudarstvennyy universitet.

SHABANOVA, Ye.A.; SEGALOVA, Ye.Ye.; REBINDER, P.A., akademik

Effect of electrolytes on the process of crystallizing structure
formation (solidification) in hemihydrate gypsum suspensions.
Dokl. AN SSSR 161 no.2:403-405 Mr '65.

(MIRA 18:4)

1. Moskovskiy gosudarstvennyy universitet im. M V. Lomonosova i
Institut fizicheskoy khimii AN SSSR.

SEKALOVA, Yr.Yr., BRUTSKUG, T.K.

Thermographic study of interaction of calcium aluminates
($3CaO \cdot Al_2O_3$ and $CaO \cdot Al_2O_3$) with gypsum. Zhuravitskiy khim.
58 no.20 (1954-1955) 5-15.

(MIRA 18:11)

In Moskovskiy gosudarstvennyy universitet.

SEGALOVICH, V.I.

Weak gravity anomaly disentanglement in prospecting
for deep-seated ore deposits. Razved. i okh.nedr 31
no.4:37 Ap '65. (MIRA 19:1)

1. Berchogurskaya geofizicheskaya ekspeditsiya.

SEGAL'YU, Ye.

Neurodynamics of vascular reflexes in hallucination-paranoid form of schizophrenia. Zh. nevropat. psikiat., Moskva 53 no.3:182-190 Mar 1953.
(GIML 25:1)

1. Institute of Psychiatry of the Ministry of Public Health USSR.

TOBILEVICH, N.Yu.; SEGAN', I.I.; GARYAZHA, V.T.

Determining the heat transfer coefficients in calculation for
installations use in evaporating and heating molasses waste.
Izv.vys.ucheb. zav.; pishch. tekhn. no.6:112-118 61. (MIRA 15:2)

1. Kiyevskiy tekhnologicheskii institut pishchevoy promyshlennosti,
kafedra teploenergetiki.

(Molasses)(Heat—Transmission)

TUTUNBEU, Dimitro, prof.; SAGREB, Aleks, prof.; cont.

Contributions to the study of spherical mechanisms for
driving the cutting units in lathes. Konstruktor 10 NO.
7:362-366 Ju. '64.

SEGARCEANU, Oprea, ing.

Funds rationally used. Constr Buc 16 no.735:1 8 F'64.

1. Responsabilul postului de corespondent: voluntari,
Brasov.

SEGARCEANU, Oprea, ing.

Typifying: saving, productivity, speed of labor. Constr Buc
16 no. 738:3 29 February 1964.

1. Din serviciul tehnologic al Trustului nr. 5 Brasov.

SEGARCEANU, Oprea, ing.

Among the best on the construction site. Constr Buc 16 no.
740:1 14 March 1964.

1. Responsabilul postului de corespondenti voluntari de la
Trustul nr. 5-Brasov.

SEGARCEANU, Oprea, ing.

Advantages of good organization of construction sites. Constr
Buc 16 no. 748:1 9 May '64.

1. Branch of Voluntary Correspondents of "Constructorul"
Brasov, Trust Nr. 5.

SEGARCEANU, Oprea, ing.

Successes regarding the achievement of the physical plan.
Constr Buc 16 no.760:1 1 Ag '64.

1. Branch of Voluntary Correspondents of "Constructorul",
Brasov, Trust No. 5.

SEBASTIANU, Oprea, ing.

A modern solution for hall roofs. Constr Buc no.76213 15 kg '64.

1. Technological Office of Trust No.5, Brasov.

REYAROMANU, O., ing., correspondent

Accomplishments in construction sites and factories. Constr Bie
IA no. 770: I 10 0'61

SEGARCEANU, Oprea, ing., correspondent

The task was carried out by the committee. Constr Buc 16
no.776:3 21 N '64.

Segarchan, T.

✓ The chlorination of titanium oxides. A. N. Zelikman and T. Segarchan (Inst. Non-Ferrous Metals and Alloys, Moscow). *Dokl. Akad. Nauk SSSR*, 26, 625-6 (1956). — Conditions for the chlorination of Ti oxides were investigated in the temp. range 300-700°. TiO , unlike TiO_2 , is chlorinated rapidly at 300°. The max. degree of chlorination is 50% where the chlorination proceeds according to the reaction $2 TiO + 2 Cl_2 = TiCl_4 + TiO_2$. With the presence of C, TiO is chlorinated much more rapidly than TiO_2 at 500°. — J. M. Widom.

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dm

LPH

Segarchanov, T.

The chlorination of titanium oxides A. N. Zelikman
and T. Segarchanov. J. Gen. Chem. U.S.S.R. 26, 721-4

(1956)(English translation).—See C.A. 50, 16312h.

B. M. R.

Chem

PM MK

GOLD, Bruce; GREENBERG, T.

Some angle is of moderate salt hydrolysis. The presence of phosphates ion. On analysis Min p. 10 of no. 19-10 is 164.

L 49235-65 EWT(1)/EPA(s)-2/T/EWP(t)/EWP(b)/EWA(h) Pz-6/Pt-7/Peb IJP(c) JD/JG/AT

ACCESSION NR: AP4047858

R/0003/64/015/009/0535/0541

AUTHOR: Olaru, M.; Segarceanu, T.; Moscovici, A.

TITLE: The purification of technical grade indium for the purpose of obtaining the pure indium used in semiconductors

SOURCE: Revista de chimie, v. 15, no. 9, 1964, 535-541

TOPIC TAGS: indium refining, indium purification, indium semiconductor, semiconductor manufacture, cadmium sublimation, iodine complex, electrolytic refining, indium anode, amalgam electrolysis

ABSTRACT: The possibility of obtaining pure indium (In= 99.999%) from indigenous (Rumanian) technical-grade indium (In =90-93%) found in the by-products resulting from metallurgical processing of zinc is investigated. Various steps for the elimination of such impurities as Cd, Pb, Sn, Cu, Zn, Tl, etc. are described in detail. The elimination of cadmium may be carried-out by the "distillation method" in an electric furnace provided with a recovery system for the volatilized Cd, at an optimum temperature of 950C and an optimum duration which is directly proportional to the initial content of Cd (usually 2-4 hours). Satisfactory results are obtained when the initial content of Cd is more than 2%; an average of 97% Cd is

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found in the volatilized product, while only traces of indium are lost; Pb, Sn and Cu remain with the indium. Another method permits the simultaneous elimination of very small quantities (0.1-0.9 %) of Cd, Cu, Pb and Sn, and is based on the formation of iodine complexes, which are very stable in comparison with indium complexes. The method consists of treating the melted indium, suspended in glycerol, with KI or small quantities of iodine at a temperature of 170-180C, according to the reaction: $\text{Cd} + \text{I}_2 + \text{KI} \rightarrow (\text{CdI}_4)\text{K}_2$. The end of the reaction is marked by the appearance of indium iodide on the surface of the metallic indium. Further purification is carried-out by electrolysis with soluble anodes made of indium (freed of cadmium); cathodes were made of titanium while the electrolyte was an indium salt solution (chloride or sulfate). Metals with a normal potential which is close to that of indium (thallium, cadmium) remain as anodic deposits and are difficult to eliminate, while those with a normal potential more negative than indium are ionized in the electrolyte. Starting from a 93% pure indium (low in Cd content), a purity of 99.95% may be obtained with this method. Finally, the elimination of micro-impurities is accomplished by the "analgam" electrolysis method" carried out in a plexi-glass bipolar cell, the amalgam being prepared by dis-

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